Space-Based Occupational Ergonomics

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A significant amount of work has been done on earth toward understanding man's physical capabilities in the working environment. Little work has been done toward understanding how well man will be able to perform work in zero-g or on the Moon or Mars, which are the two most likely candidates for manned exploration in the foreseeable future of man's explorations of space.

Some insight can be gained from the Apollo program. Astronauts performed some lifting, bending, and other tasks on the moon. However, no provision for systematic study was done on these activities. As a result, we know very little about the limits of man's work capacity on the moon.

This paper provides a review of previous work in the area and discusses some possible test methodologies using earth-based testing for determining man's lifting and other capabilities on the moon and elsewhere.

Consideration must be given to man's capabilities across a range of g forces before the equipment is designed and tasks developed. Should this not be done, an astronaut might arrive on Mars expected to perform some task which is physically impossible. This consideration must necessarily include both suited and unsuited activities, since it is anticipated that people will work both inside and outside the structures built there.